PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project	
Salmon River Anadromous Fish Passage Enhancement	
BPA project number	9306200
Contract renewal date (mm/yyyy)	12/99
Multiple actions? (indicate Yes or No)	
Business name of agency, institution or organization requesting funding	
Lemhi and Custer Soil and Water Conservation Districts	
Business acronym (if appropriate)	LSWCD, CSWCD
Proposal contact person or principal investigator:	
Name	Glenn Seaberg, Project Coordinator
Mailing address	206 Van Dreff Ste A
City, ST Zip	Salmon, ID 83467
Phone	208-756-6322
Fax	208-756-6376
Email address	mws@dmi.net
NPPC Program Measure Number(s) which this project addresses	
7.6, 7.7 Habitat and Model Watersheds	
FWS/NMFS Biological Opinion Number(s) which this project addresses	
NMFS Recovery Plan for Snake River Salmon, task numbers 1.6b Endangered Species Act consultation done on a site specific project by project basis	
Other planning document references	
Idaho Soil Conservation Commission and Bonneville Power Administration. 1995. Model Watershed Plan for the Lemhi Pahsimeroi and East Fork of the Salmon Rivers, Idaho. DOE/BP-2772, Bonneville Power Adminsitration, Portland, Oregon.	
Short description	
To protect, enhance and restore anadromous and resident fish habitat and achieve and maintain a balance between resource protection and resource use on a holistic watershed management basis.	
Target species	
Snake River Spring Chinook salmon, *Oncorhynchus tshawytscha* Snake River Summer Steelhead trout, *Oncorhynchus mykiss* Salmon River Basin Bull trout, *Salvelinus confluentus* Salmon River Basin Cutthroat trout, *Oncorhynchus lewisi*	

Section 2. Sorting and evaluation

Subbasin
Salmon River Subbasin

Evaluation Process Sort

CBFWA caucus	CBFWA eval. process	ISRP project type
X one or more caucus	If your project fits either of these processes, X one or both	X one or more categories

X	Anadromous fish		Multi-year (milestone-based evaluation)	X	Watershed councils/model watersheds
	Resident Fish	X	Watershed project eval.		Information dissemination
	Wildlife				Operation & maintenance
					New construction
					Research & monitoring
				X	Implementation & mgmt
					Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9202603	Model Watershed Coordination and Administration/Implementation Support	Directly supports the Model Watershed project coordinator, office coordinator, office space, and equipment.
9401700	Idaho Model Watershed Habitat Projects	A co-project for the Model Watershed project area which specifically addresses anadromous fish habitat.
9401500	Idaho Fish Screening Improvement-O&M	A related project to reduce fish mortality in irrigation diversions.
8909800	Idaho Supplementation Studies Information Collection	This project is part of ISS research which is used for monitoring and evaluating anadromous and resident stocks within the Model Watershed project area.
9009	Restore the Salmon River, in Challis, Idaho	This projects area is outside the current MWP area, however it compliments the current habitat and passage projects in the upper Salmon River basin.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1993	Stabilized 200 yards of streambank on East Fork of the Salmon River.	Reduce sediment levels within spawning gravels
1993	Improved 29 irrigation diversion structures on the Lemhi River.	Reduce the number of physical barriers that hinder migration and maintain flows
1994	experimental “fish flush” conducted by irrigators to allow chinook adults passage to spawning areas on Lemhi River.	Reduce the number of physical barriers that hinder migration
1994	Big Flat Ditch siphon completed to reconnect Carmen Creek to the mainstem Salmon River.	Reduce the number of physical barriers that hinder migration
1995	Riparian enhancement fence completed on 4.5 miles of streambank on two ranches in the Pahsimeroi and three ranches on the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1995	Point of diversion transferred from the Pahsimeroi River to the Salmon River.	Increase instream flows
1995	Two diversions eliminated on Lemhi River with a combined net savings of 1,600 acre feet of water.	Increase instream flows
1995	Seven irrigation diversions consolidated into three irrigation diversions on Lemhi River.	Reduce the number of physical barriers that hinder migration
1996	Three ranches near Leadore construct fencing and implement grazing/pasture management systems along 5.75 miles of critical stream habitat along Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1996	Two canals eliminated from the Salmon River through consolidation into Challis Irrigation Canal.	Reduce the number of physical barriers that hinder migration
1996	Constructed riparian enhancement fences on two ranches in East Fork along 1.75 miles of river.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1996	Diversions EF-7 and EF-8 consolidated on East Fork.	Reduce the number of physical barriers that hinder migration
1997	Completed L-3A diversion structure and bypass system on Lemhi River.	Reduce the number of physical barriers that hinder migration

1997	Reset pipe on old L-5 diversion to provide off-channel rearing habitat on Lemhi River.	Develop new rearing and resting pools.
1997	Constructed 0.75 miles of fence and developed a grazing system for a ranch along the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Constructed 15 miles of fence on 8.5 miles of the upper Lemhi River along critical chinook spawning and rearing habitat.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks. Reduce sediment levels within spawning gravels.
1997	Streambank stabilization and off-channel rearing site along lower Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks. Develop new rearing and resting pools.
1997	Construction of 0.85 miles of fence on the lower Lemhi stream reach.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Construction of 0.75 miles of fence along Pattee Creek, tributary to Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Riparian pasture management fencing was constructed on three ranches along 3 miles of the Pahsimeroi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1997	Phase I of a riparian management project on the East Fork installed a series of instream bank stabilization structures.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	At L-8a diversion, a headgate, wasteway, and vortex weir were installed to facilitate fish passage and eliminate gravel push up dams on Lemhi River.	Reduce the number of physical barriers that hinder migration
1998	Riparian fence along 0.90 miles of the upper Lemhi River and Texas Creek, tributary to the Lemhi.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence along 1.2 miles of Hayden Creek, tributary to the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence along 1.0 mile of Eighteenmile Creek a headwater tributary of the Lemhi River.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence and grazing management system along 1.0 mile of Pahsimeroi River/Patterson Creek.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks
1998	Riparian fence have been started with 3 landowners along 2.8 miles of the East Fork.	Establish riparian vegetative cover to reduce water temperatures and stabilize streambanks

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Increase instream flow during critical fish migration period	a	improve water conveyance efficiency on Canyon Creek irrigation diversions in the Lemhi
		b	improve water application efficiency on Canyon Creek irrigation diversions through sprinkler systems
		c	improve water conveyance efficiency on Little Morgan Creek irrigation diversions in the Pahsimeroi
		d	improve water application efficiency on Little Morgan Creek irrigation diversions through sprinkler systems
2	Reduce the number of physical barriers hindering fish migrations	a	reconnect Canyon Creek to the Lemhi River
		b	reconnect Little Morgan Creek to the Pahsimeroi

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	01/2000	12/2000	Increase instream flow during critical fish migration period		80%
2	01/2000	12/2000	Reduce the number of physical barriers hindering fish migrations		20%
				Total	100%

Schedule constraints

The current perception of the local Soil and Water Conservation Districts is that if it can be designed to have benefits for the landowner as well as the fish habitat, the landowner will participate. Due to the cooperative nature of the Model Watershed Project, project evaluation can be a complicated and lengthy process. Project scope often changes with the development of consensus, perception of needs, and state and federal permit requirements. Unavailability of technical support can slow down planning needs such as biological assessments and cultural resource clearances. This evolving process makes annual budgeting a difficult task as planners and cooperators become aware of project needs. Also, with annual variation in chinook spawn timing and fish distribution, streamside projects may need to be delayed or expedited accordingly to minimize possible negative impacts to listed species. Further delays may occur to accommodate the management needs of the landowner (i.e. irrigation diversion can't be shut down during critical irrigation periods). Other limiting factors including weather, flooding, and availability of materials can constrain the implementation of projects.

Completion date

2005

Section 5. Budget

FY99 project budget (BPA obligated):	$100,000

FY2000 budget by line item

Item	Note	% of total	FY2000 ($)
Personnel	MWP Coordinator, Planner and NRCS/IDFG Engineering Staff paid from BPA Project #'s 9202603 and 9401700		0
Fringe benefits			0
Supplies, materials, non-expendable property			66,500
Operations & maintenance			0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)			0
NEPA costs			0
Construction-related support			28,500
PIT tags	# of tags:		0
Travel	covered under related projects		0
Indirect costs	5% SWCD overhead		5,000
Subcontractor			0
Other			0

TOTAL BPA REQUESTED BUDGET	$100,000

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
Landowner	Labor, Contracting, O&M	30%	160,000
ID Fish & Game	Project Funding	10%	40,000
Bureau of Reclamation	Project Funding	25%	100,000
U.S. Fish & Wildlife	Project Funding	5%	20,000
	Subtotal		320,000
		Total project cost (including BPA portion)	$720,000

All amounts in "Cost Sharing" table are estimates based on past contributions.

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$100,000	$100,000	$100,000	$100,000

Section 6. References

Watershed?	Reference
	A guide to establishing points and taking photographs to monitor watershed management projects. 1993. The Govenors Watershed Enhancement Board. Salem, OR
	Dorratcaque, D. E., 1986. Lemhi River Habitat Improvement Study. BPA contract number DE-AC79-84BP17447, project number 84-28, Portland, OR..
	Feldhausen, S. et. al.1998. Lemhi River Sub-basin Assessment Draft Document.
	Idaho Soil Conservation Commission and Bonneville Power Administration. 1995. Model Watershed Plan for the Lemhi Pahsimeroi and East Fork of the Salmon Rivers, Idaho. DOE/BP-2772, Bonneville Power Adminsitration, Portland, Oregon.
	Northwest Power Planning Council. 1994. Columbia River Basin fish and Wildlife Program. Northwest Power Planning Council, Portland, Oregon.
	U.S. Government, Federal Register. (57 FR 14653) Listing of Snake River fall chinook and Salmon River spring/summer chinook as threatened. April 22, 1992. Washington D. C., 57:14653.
	U.S. Government, Federal Register. (59 FR 42529) Reclassification of Snake River fall chinook and Salmon River spring/summer chinook as endangered. August 18, 1994. Washington D. C., 59:42529.
	U.S. Department of Commerce (USDC). National Oceanic and Atmospheric Administration (NOAA). National Marine Fisheries Service (NMFS). In Review. Final Recovery Plan for Snake River Salmon.

PART II - NARRATIVE

Section 7. Abstract

The Idaho Model Watershed Project (MWP) was initiated in 1992 by the Idaho Soil Conservation Commission as part of the Northwest Power Planning Council's plan for salmon recovery in the Columbia River Basin. The project is administered through Lemhi and Custer Soil and Water Conservation Districts and is coordinated through the Idaho Model Watershed Project Advisory and Technical Committee. This project is located in Central Idaho and involves three watersheds; the Lemhi River, the Pahsimeroi River, and the East Fork of the Salmon River. Currently, these watersheds provide habitat for approximately 75% of the upper Salmon River

anadromous fish. The vision of the MWP is to provide a basis of coordination and cooperation between local, private, state, tribal and federal fish and land managers, land owners and others to protect, restore and enhance anadromous fish habitat. The objective of this project is to identify fish passage problems and implement appropropriate passage restoration projects for anadromous and resident fish habitat enhancement on private and public land using a watershed approach in the upper Salmon River Basin. Fish migration problems have been identified in the Model Watershed Plan (1995) and the Stream Habitat Inventory for the Lemhi, Pahsimeroi and East Fork Salmon Rivers, (1994 unpublished). We are in the process of implementing appropriate habitat enhancement and passage restoration projects. These include fishways, irrigation diversion consolidations and structures, improved water distribution, improved secondary channel habitat, streambank stabilization, irrigation system development, portable fish screens and instream flow agreements as they relate to adult and juvenile fish migration. A portion of the identified projects in our priority areas are being constructed each year. The MWP assists landowners in developing plans, funding assistance, and technical advice. This project has supported the installation of 20 structures modified for irrigation water conservation and control and consolidation of 18 diversion canals.

Section 8. Project description

a. Technical and/or scientific background

Idaho's Model Watershed Project (MWP) is located in the southeast portion of central Idaho. The project area includes drainages from three Salmon River tributaries: the Lemhi, Pahsimeroi and East Fork of the Salmon River. Together these three rivers encompass a 687,533 hectare (1,698,870 acre) drainage area. Elevations range from 1,220 meters (4,000 feet) above sea level to more than 3,048 meters (10,000 feet) on several mountain peaks. The Model Watershed project area averages 23 centimeters (9 inches) of precipitation annually (Idaho Soil Conservation Commission 1995). The climate is characterized by cold winters and warm summers. Air temperatures during the summer can exceed 37.7°C (100°F) and drop below -17.7°C (0°F) in the winter throughout the Salmon River Subbasin. The Lemhi River runs down the center of a wide, fertile valley. The valley is approximately 4.8 kilometers (3 miles) wide at the mouth gradually narrowing to approximately 0.08 kilometers (½ mile) wide at the town of Lemhi, 54.7 kilometers (34 miles) above the mouth. From Lemhi to Leadore the valley gradually opens out onto a mountain plateau about 8 kilometers (5 miles) wide. The Pahsimeroi River runs down the center of a broad 6-8 kilometer (4-5 miles) wide valley. The East Fork River drainage is very steep and has a valley floor less than 1.6 kilometers (1 mile) wide. The dominant types of riparian vegetation may include: black cottonwood (*Populus trichocarpa*), alder, sandbar willow (*Salix exigua*), yellow willow (*Salix lutea*), Booth's willow (*Salix boothi*), Wood's rose (*Rosa woodsii*), red-osier dogwood (*Cornus sericea*), common spike-rush, Baltic rush, several sedge species, and several pasture grasses. All three watersheds are similar in terms of land use , agricultural operations, community interests, and fisheries problems.

Prior to settlement, chinook salmon were a major dietary staple for the Nez Perce, Shoshone, and Bannock Indians who frequented or seasonally inhabited the tributaries of the upper Salmon River. All three tributaries in the MWP area historically produced major salmon runs. It is estimated that 30,000 to 60,000 chinook salmon were harvested annually by tribal fisherman (Peebles 1971). The salmon run was first exploited commercially by the Mormon missionaries who established Fort Lemhi. It is reported in their journals that they exported seven wagon loads of dried salmon to Salt Lake City in 1857 (Nash 1974). Gold discoveries created the first major influx of settlers into the region, closely followed by the emergence of the livestock industry in the 1870's. Cattle herds from Oregon, Utah and Montana were grazed in the mountains in the summer and in the lower meadows in the winter. A severe winter in 1899 brought an end to this practice and ranchers began raising and storing hay for winter feeding (ISCC 1995).

Since the 1940's, stocks of chinook salmon entering the MWP area have declined precipitously. Many factors contributed to the decline of these fish runs, including hydropower development, hatcheries, overharvesting, and habitat degradation. The five year average for chinook redds from 1960 to 1965 was 1,200 redds for the Lemhi River, 700 redds for the Pahsimeroi River and 775 redds for the East Fork River. During the last five years, the average redd count was 26 redds for the Lemhi River, 14 redds for the Pahsimeroi River and 17 redds for the East Fork River. Given these major population declines habitat degradation and migration problems have been closely scrutinized. Census of Agriculture data indicate that irrigated agriculture acreage has remained virtually the same from 1944 to 1987 in Lemhi County, ranging from 79,211 acres to 77,646 acres.

Current land ownership and management in the MWP area consists of approximately 95 percent federally managed lands. However, private landowners manage approximately 90 percent of the river flood plains which also encompass the remaining critical habitat for chinook salmon.

Due to these declines the Snake River spring/summer chinook salmon were listed under the Endangered Species Act as threatened on April 22, 1992 (57 FR 42529) and the Lemhi, Pahsimeroi and East Fork of the Salmon River are all classified as critical habitat (57 FR 14653). To assist in recovery efforts, the Lemhi Model Watershed Project was established to attempt to maximize chinook spawning, rearing and migration through habitat enhancements, while considering current land use practices through a watershed approach.

Upper Salmon chinook runs have persisted for over 10,000 years. There annual inland migration covers almost 1,448 kilometers (900 miles) and ascends over 1.6 kilometers (1 mile) in elevation. The process of natural selection has equipped local stocks with a unique set of adaptations to survive and return to their natal streams. Over thirty-two different chinook stocks are recognized in Idaho. Each specially adapted for persistence in their subbasin. All remaining stocks of chinook salmon and their habitat are critical to the persistence and recovery of this species.

In January 1993, the Lemhi Model Watershed project became the umbrella for salmon recovery activities for the Lemhi, Pahsimeroi and East Fork of the Salmon rivers. The Model Watershed technical team comprised of local, state, and federal agencies initially determined a fisheries habitat inventory was necessary for all three MWP areas to identify habitat conditions and then prioritize recovery actions in each drainage based on fish use and habitat conditions and limitations. Over 193 kilometers (120 miles) of inventories were conducted in 1994 among the three drainages, encompassing 9 different river segments. Each drainage was partitioned into different segments based on geological features, unique biological values and past uses or alterations. Each segment was inventoried using modified protocols developed by the Idaho Division of Environmental Quality. Information collected included substrate composition, lengths of habitat units, width and depths at predetermined intervals, cobble embeddedness, spawning potential, and bank stability. At the completion of the inventory the data was analyzed by stream segment and interpreted for width to depth ratio's and slow water to fast water ratio's results of the segment by segment habitat assessment were then compared to other existing biological data (i.e. water flows, temperature, potential barriers) and a list of prioritized goals and actions were developed for each drainage and among the three drainages. These established goals and actions of the Model Watershed Plan have been used since to direct recovery efforts among the three drainages and river segments. Limiting factors identified through the inventory efforts include: inadequate water flows, excessive water temperatures, lack of bank stabilization and riparian vegetation, elevated sediment levels, and physical barriers to migration. Below lists what has been accomplished to date to address each of these limiting factors. Projects to date have included the savings of 1,600 acre feet of water through the removal and consolidation of irrigation diversions and land transfers on the Lemhi River. This included the L3A, L4, L5, L-6, L7, and L7A diversions on the lower Lemhi River. Since the completion of this project in 1996 the lower river has yet to be dewatered. Prior to this effort, the river would typically be dewatered from 1 to 6 weeks during dry years. This dewatering coincided with the arrival of adult chinook salmon in August just prior to their spawning in the upper Lemhi River (Bjorn, IDFG). In the Pahsimeroi River a diversion structure was eliminated through water right transfer to the Salmon River on the Parkinson Seed Farm. This reconnected approximately 6 miles of habitat that was previously dewatered and provided barrier free fish migration to higher reaches in the river into good quality spring-fed tributaries.

To address the limiting factors of excessive water temperatures, lack of bank stability and riparian vegetation and elevated sediment levels, the MWP has been involved with riparian protection and rehabilitation through riparian fences and willow planting. Most of the physical barriers to migration within the MWP was identified as man-made irrigation diversions. Since inception of the MWP, 18 diversions have been consolidated and or modified to improve passage of both adult and juvenile fish. Many of the major barriers noted during the habitat inventory have been addressed and many projects are still in progress in cooperation with the MWP. Monitoring sites within each project have been established to evaluate the effectiveness of the projects. These monitoring programs include vegetation monitoring, stream width and depth monitoring, temperature monitoring and established photo points. Other biological monitoring occurring includes fish density/composition observations and resident fish spawning ground counts. Since the implementation of habitat projects in the upper Lemhi, numbers of spawners in resident rainbow spawning ground counts have increased over 100% in the three sites monitored (IDFG 1998 in review). This indicates that the benefits of habitat improvements are already being realized. Most other data being collected is long term in nature and will take several years for results to be apparent.

For the MWP to be successful it must establish a working relationship with the private landowners and resource users to effectively identify and develop remedial actions for areas of concern on private lands. These remedial actions must be developed with the landowner and their management needs for it to be successful. Local private landowners continue to be very interested in working with the MWP in anadromous fish recovery.

The proposed action of the Lemhi Model Watershed Project is supported by the Final Snake River Salmon Recovery Plan (NMFS, in review) and is addressed in Section 7 of the Columbia River Basin Fish and Wildlife Program (NPPC 1994). Both program support the action of protecting and restoring important habitat on federal and private lands, and protecting watersheds that contain good quality habitat that can be readily restored. The proposed actions of the Lemhi MWP will improve water quality (sediment inputs, temperatures) while benefitting the biological needs of salmon, steelhead, bulltrout, and other fish and wildlife species. In addressing, habitat issues the MWP focuses habitat restoration holistically rather than at the single species level. Any remedial habitat efforts directly benefit several listed or proposed listing fishes. All native trout or salmon species present in all three MWP drainages are or are either proposed for listing.

b. Rationale and significance to Regional Programs

The Lemhi Model Watershed Project (MWP) has direct significance to the Regional Fish and Wildlife Program section 7.6C of the 1994 Columbia Basin Fish and Wildlife Authority. This section specifically addresses model watershed projects and their role in helping to reach the stated goals and objectives. Section 7.6C.1 calls for fisheries, land and water managers to develop a more comprehensive set of habitat performance standards taking into account differences in climate, location, soils, topography and other pertinent factors unique to each area (NPPC 1994). The council included in Table 7-1 the elements of habitat performance standards to be measured. The Lemhi MWP followed these elements closely when developing its habitat inventory of 120 miles of stream within the MWP and uses aspects of elements for monitoring and evaluation. FWP section 7.7 directly address habitat protection and improvement with private landowners. The Lemhi MWP was designed and does work for cooperative habitat protection and improvement with private landowners. The Lemhi MWP has effectively "bridged the gap" between private, local, state and federal management on a watershed basis. Habitat issues such as spawning, rearing, and migration habitat have been and are still being directly addressed for anadromous and resident fishes and wildlife on private ground. Specifically, sediment, bank stability, water quality, large woody debris, instream flow, and riparian vegetation are targeted by the habitat management objectives.

Measure 7.6A.1 calls for coordination of human activities on a comprehensive watershed management basis. The Lemhi MWP has fostered the coordination of such activities to benefit the fisheries resource. For example, in August 1994 the MWP coordinated an experimental "fish flush" with the Lemhi River Irrigators. Over 100 irrigators voluntarily participated by turning off diversion water for a 12 hour period. The purpose was to determine if a dewatered section of the Lemhi River, below L-7 diversion, would recharge and allow spring chinook salmon adults to migrate upstream. The experiment was deemed a success and allowed private water users to voluntarily participate in salmon recovery. Since the "fish flush" experiment, water users in the dewatered portion of the river have worked with the MWP, local, state, and federal agencies to consolidate and retire diversions in this area. Since completion of the L-6 water conservation project in 1996, this section of river has yet to be dewatered.

Measure 7.6A.2 addresses improved productivity of salmon and steelhead habitat which is critical to the recovery of weak stocks. The Lemhi, Pahsimeroi and East Fork Rivers have been designated as critical habitat (57 FR 14653) and all stocks are presently very depressed. The MWP through its efforts in riparian recovery, bank stabilization, and the removal of physical migration barriers is improving habitat productivity while protecting and enhancing critical habitat. Resident rainbow spawning ground surveys conducted within past project areas have increased 100% since 1994, indicating habitat improvements may be working (IDFG 1998, in printing). In the fall of 1998, record numbers of presmolt spring chinook salmon have been observed at a fish trap operated by the Idaho Department of Fish and Game on the mainstem Lemhi River near the mouth of Hayden Creek (Tom Curet, personal communication). Preliminary indications are that egg to smolt survival rates may be higher in 1998 than in any other year since the study was began in 1993.

Measure 7.6B.6 encourages involvement with volunteers and educational institutions in cooperative enhancement projects. The MWP has been actively involved with Brooklyn Middle School, Pioneer Elementary School, and the Challis, Leadore, and Shoshone-Bannock High Schools working with streamside incubators and

living stream classroom projects. During these activities, school children learn the value of working cooperatively on resource projects and become familiar with the accomplishments of the MWP. In 1999, the Leadore High School is planning a bank stabilization project in the upper Lemhi River with the assistance of the MWP. The Challis High School plans to assist the MWP with bank stabilization on the Pahsimeroi River.

c. Relationships to other projects

BPA Project #9202603, Model Watershed Coordination and Administration/Implementation Support, directly supports the Model Watershed project coordinator, office coordinator, office space and equipment. Habitat projects could not be implemented without this funding.

BPA Project #9401700, Idaho Model Watershed Habitat Projects, is a co-project for the same project area which specifically addresses anadromous fish habitat issues.

BPA Project # 9401500, Idaho Fish Screening Improvement-O&M, reduces fish mortality in irrigation diversions.

BPA Project # 9009, Restore the Salmon River, in the Challis, Idaho area is outside the current MWP area, however it compliments the current habitat and passage projects in the upper Salmon River basin.

BPA Project #8909800, Idaho Supplementation Studies Information Collection is part of ISS research is used for monitoring and evaluating anadromous and resident stocks within the Model Watershed project area.

d. Project history (for ongoing projects)

In 1993 the U.S. Forest Service, Inter-Mountain Region (USFS), contracted with Bonneville Power Administration (BPA) to improve habitat for anadromous fish (Project 93-62, Upper Salmon Anadromous Fish Passage Enhancement Project, Agreement No. DE-A1 7993BP00818). The USFS began NEPA and BA (biological assessment) report for the projects in the contract with the start of construction planned for 1994. The projects are designed to prvide offsite mitigation for fish losses resulting from the Columbia River hydroelectric system. Fish population responsees are being documented by the Idaho Department of Fish and Game (IDFG) as a part of BPA Project 83-7.

In 1994, a siphon was installed to convey Salmon River water under Carmen Creek and eliminate the dewatering of Carmen Creek during spring for irrigation. This was done on a cost-share basis with the irrigators. Another diversion was eliminated from Carmen Creek with a cooperative agreement with the land owner to use the Big Flat Ditch as their water source. A pipeline from the Big Flat Ditch was installed using a grant and the heading from Carmen Creek eliminated.

On May 26, 1997 the Bonneville Power Administration issued a new contract (97-BI33937), project number 93-62, Salmon River Fish Passage Enhancement to the Lemhi Soil and Water Conservation District. This project falls under the guidance of the Model Watershed and carries on the work described above and in contract number AI-00818. Under the current contract the L-3a diversion structure and bypass system, and the headgate , wasteway and vortex weir were installed at L-8a in the Lemhi River.

e. Proposal objectives

The primary goal of this watershed program is to protect, enhance, and restore salmon habitat, while maintaining a balance between resource protection and use. The MWP strategy has been to first assess resource conditions within each drainage basin, then implement coordinated actions that will help rebuild salmon runs. The Model Watershed Plan (1995) is a critical element of this planning process. Since approximately 90 percent of the occupied salmon habitat in these watersheds is located on private lands, this plan focuses on the habitat problems and opportunities in these areas. Salmon habitat on public lands is being address through other coordinated planning efforts in the area. The Model Watershed Plan (1995) is intended to be a dynamic document that will change over time. Changes are likely to occur as more is learned about the watershed and its processes. Changes may also occur as projects are implemented and evaluated according to plan guidelines, i.e. adaptive management.

Irrigation diversions can be detrimental to migrating fish in several ways, juveniles can be diverted into irrigation canals causing migration delays and mortalities, gravel berms constructed in the stream to divert water can act as passage impediments to adult fish and often results in dewatering down stream sections. Instream operation of heavy equipment to construct gravel irrigation berms causes streambed disturbance releasing sediment into the stream and poses a risk of spills of petroleum or other toxic substances. The objective of this project is to work with private landowners to develop projects which address these issues through consolidating diversions, screening diversions, improving headgates, improving water conveyance efficiency, improving water distribution to increase instream flows, reconnection of historic anadromous spawning and rearing tributaries, and in some extreme cases acquiring agreements from land owners to leave water instream during critical passage periods from willing participants to improve passage past currently dewatered reaches.

f. Methods

The resource inventories included in the Model Watershed Plan (1995) identify five factors limiting salmon production in the project area. These inventories identified the following major problems.

1) Inadequate water flows
2) Physical barriers
3) High water temperatures
4) Lack of streamside vegetation
5) High sediment levels

To solve these problems, habitat objectives were established for each watershed that reduce mortality and enhance spawning, rearing and migration habitat in the Lemhi, Pahsimeroi and East Fork of the Salmon Rivers.

1) Increase instream flows during critical fish migration periods,
2) Reduce the number of physical barriers hindering fish migrations,
3) Develop new rearing and resting pools,
4) Establish riparian vegetation along critical areas to provide cover and reduce water temperatures, and
5) Reduce the sediment levels within spawning gravels.

To accomplish these objectives, contracts are developed with participating landowners on a voluntary basis. The majority of projects are landowner initiated while others are brought forward by agency personnel. After an initial field visit with the project cooperator, project proposals are filled out for the project. Proposals identify objectives, habitat problems, tasks, benefits, and budget needs specific to the project. These proposals are presented to a technical committee composed of resource professionals, who evaluate the project for fish benefit, technical merit, and likelihood of success. The Lemhi and Custer Soil and Water Conservation Districts are responsible for program review and planning review in their respective districts. The local conservation districts are key to the whole process through ensuring local participation and support. There is no other local district or agency that has the local knowledge and leadership to institute change in private land and water management. District leaders know what is socially and economically feasible in their areas. The SWCD's give the final approval for the implementation of proposed projects and disbursement of funds to complete the work.

Project cooperators are responsible for obtaining bids and selecting a contractor to complete project work. They a responsible to obtain all permits, easements, and rights of way. Operation and maintenance of MWP habitat restoration and fish passage projects are the responsibility of the private landowners. Long-term operation and maintenance of the project will continue for the time period specified in the landowners contract with the SWCD.

Projects may involve a variety of work methods addressing the tasks listed in Section 4. The approach and methods for any given restoration project are individually developed using available technical expertise and landowner objectives. Technical expertise is contributed by the Bureau of Reclamation (BoR), Natural Resource Conservation Service (NRCS), Idaho Department of Fish and Game (IDFG), Bureau of Land Management (BLM), and USDA Forest Service (USFS). Projects that require engineering are often designed by either BoR or NRCS engineers and reviewed by fisheries biologists from BLM, USFS, and IDFG. The IDFG Screen Shop design and install all fish screening projects. Often projects are planned with multiple objectives in mind, such that several agencies are meeting specific objectives with the completion of one project. Supplemental funding may come from the Idaho Department of Fish and Game and possibly the Bureau of Reclamation. These cost-shares may come in the form of material, equipment, labor, personnel time, or actual funding dollars. Efforts will continue to inventory

and map fish barriers and to consolidate and improve irrigation diversions in the Lemhi, Pahsimeroi, and East Fork Rivers.

Monitoring and Evaluation: The Model Watershed Plan (1995) outlines a series of actions designed to improve fish habitat conditions within the three target watersheds of the Lemhi, Pahsimeroi, and East Fork of the Salmon rivers. The ultimate goal is to restore fish numbers to levels that were present in the 1960's.

This plan conducts monitoring on three different levels. *Baseline monitoring* is conducted to characterize existing conditions and to establish a database for planning or future comparisons. *Implementation monitoring* which includes projects which have been implemented and whether projects were implemented as planned. It asks the question, Did we do what we said we would?

The third level of monitoring focuses on *effectiveness monitoring* which measures the effects on specific habitat parameters, such as

- sediments in spawning gravels
- water temperatures in relation to ambient air temperature
- stream flows in critical sections
- streambank stability
- water quality
- riparian cover

Individual actions are evaluated, as well as, cumulative effects of different actions. To measure changes in these habitat parameters, reference sites will be established in key watershed reaches. Detailed habitat inventories were conducted in a 1994 Habitat Survey to establish baseline data and monitor future changes. Water temperature data is collected year around using 100 HOBO data loggers. The data is collected through the interagency cooperation of the Model Watershed Technical Committee including Forest Service, Bureau of Land Management, Idaho Fish & Game, the Bureau of Reclamation, and Shoshone-Bannock Tribes, Department of Environmental Quality and others. Fish populations are evaluated annually by the IDFG through snorkel and redd counts.

All sites are documented with photographs during the scouting phase of the project. Photo-points are used to document visual changes in channel stability, riparian vegetation, and structures. Completed projects are photographed annually at a time consistent with previous photographs, using established photo-points. Project monitoring results are reviewed annually .

g. Facilities and equipment

Administration and coordination funding for the Model Watershed Project is provided through BPA contract # 9202603 through the Idaho Soil Conservation Commission. Part of this funding provides office space, phone, fax, copier, meeting table, desks, file cabinets, monitoring camera, computers, computer software, and a vehicle. Other equipment and facilities are shared with other agencies. Without the coordination funding and the help from other agencies and entities, the site-specific projects would not be implemented.

h. Budget

Personnel -Cost associated with salary for Model Watershed planner and coordinator paid from BPA projects #'s 9202603 and 947100. NRCS/IDFG engineer staff paid by respective agencies and considered a portion of the cost share displayed in project # 9202603 proposal for planning and technical support.

Fringe benefits -none.

Supplies, materials, non-expendable property -includes purchasing of mainline for improved water transmission delivery. Also included is equipment related to improved irrigation systems and a installion of a siphon where an irrigation ditch and the reconnected creek currently comingle water. Estimated cost $66,500.

Operations & maintenance -none.

Capital acquisitions or improvements -none.

NEPA costs -none, covered under BPA project # 9202603.

Construction related support -includes the cost of contracting the installation of mainline pipe, improved irrigation systems and a siphon utilizing local heavy equipment contractors. Estimated cost $28,500.

Pit tags none.

Travel -covered under related projects.

Indirect costs -includes Soil and Water Conservation District overhead a 5%. Estimated cost $5,000.

Subcontractor -none.

Other -none.

Total BPA budget $100,000.

Section 9. Key personnel

Glenn Seaberg, Project Coordinator, Full Time
Duties: Implements "Model Watershed Plan" on a watershed scale. Works with MWP Advisory Committee and Technical Team to identify and evaluate the impacts of all proposed and implemented actions to fish habitat and fish passage projects on a watershed scale. Provide coordination and leadership in an integrated effort of watershed management on private and public lands. Works with other agencies and landowners in evaluating the impacts of all proposed and implemented actions on watershed management. Supervises office coordinator and project planner. Coordinates and manages funding and budget expenditures for MWP. Assists participants in grant proposals and funding needs for watershed projects. Prepares work plans and budgets for administration, passage, and habitat projects in coordination with the Custer and Lemhi Soil & Water Conservation Districts.

Katie Slavin, Office Coordinator, ½ time or 85 hours a month.
Duties: General office duties including meeting minutes, agendas, filing, computer data entry, and correspondence. Also responsible for newsletters, news releases, and poster board display. Finalizes quarterly reports to BPA and assists with preparation of work plans and budgets.

Allen Bradbury, Project Planner, Lemhi Soil Conservation District employee (Full Time)
Duties: Assist Project Coordinator with planning and implementation of projects at all phases. Collect information and data on projects, meet with landowners or landmanagers and negotiate contracts for funding. Monitors past and on-going projects and follow-up with funding agencies and landowners.

Kathy Weaver, SCC Program Coordinator, 5% of staff time dedicated to MWS
Duties: Assist with meeting facilitation, information and education consultation and training to MWP Coordinator and Clerk.

Biff Burleigh, SCC Project Specialist, 5% of staff time dedicated to MWS
Duties: Perform liaison between SCC, SCD's, NRCS, and Project Coordinator. Assist Coordinator with progress reports and assess project needs as requested.

SCC Secretarial, SCC staff support clerical, Temporary, part time.
Duties: Employee is responsible for processing and paying all MWP expenses including salaries, office rent, travel, supplies, and equipment leases. All financial transactions are paid from Boise SCC office.

Section 10. Information/technology transfer

The MWP has an aggressive information and education program. The MWP office publishes three newsletters per year which are mailed to all postal patrons in Lemhi and Custer counties plus many other interested parties. Three to four tours of MWP project sites are conducted which are attended by state representatives, county commissioners, interested citizens, agency personnel. All three MWP office employees participate in public speaking and presentations to elementary school children, community members, government officials, and university professors.